

thick caruncle or pad. Rostrum protruded in front, thick and cylindrical, with many recurved spines and eight little tubular short processes at the tip, with a small lobe or pad. Mandibles of the length of the rostrum or a little longer, the end recurved and terminating in a sharpish point.

Hab. In the gape of the penguin.

This is evidently a true tick, having the characteristic rostrum and dorsal shield of the genus. I have found no species described exactly resembling it.

It may be supposed that so large a parasite must be greatly inconvenient to the penguin, but its position would seem also to offer easy opportunities for getting rid of it if the bird chose to do so.

EXPLANATION OF PLATE VII., FIGS 12-14.

Fig. 12. *Ixodes*, dorsal view, about 4 times nat. size.

Fig. 13. „ foot.

Fig. 14. „ rostrum and mandibles.

ART. IV.—*Further Notes on Coccidæ in New Zealand.*

By W. M. MASKELL, F.R.M.S.

[Read before the Wellington Philosophical Society, 13th February, 1885.]

Plate VIII.

A PARAGRAPH in “Nature” of September, 1884, referring to my last paper on New Zealand Coccids, recommends me to try the application of kerosene to infested trees. This recommendation is more particularly directed to the case of *Icerya purchasi*. In another part of the same journal, I find a notice of some papers by Professor C. V. Riley, of Washington, in which the use of kerosene is also urged; and the remedy is characterized by “Nature” as “new.” Considering that ever since 1878 I have been constantly preaching the employment of kerosene against scale insects, often against adverse criticism, it is not a little amusing to me to receive advice to try the very thing which, in my first paper in these Transactions, I originally proposed. “Nature” perhaps also overlooks, in connection with *Icerya purchasi*, that there is some difference between treating garden plants, or even orange-trees, and perhaps several acres of forest, or trees fifty feet high, or many chains of gorse fences.

In the same paragraph exception is taken to the “extreme roughness” of the plates attached to my paper. *Non cuius homini contingit adire Corinthum.* We are not all artists, nor have we always in this country engravers who are able to improve the “roughness” of our original drawings.

Group.—DIASPIDÆ.

Genus, *Aspidiotus*, Bouché.

1. *Aspidiotus camellia*, Boisduval.

In my paper of 1878 (Trans. vol. xi., p. 200), I reported this insect as attacking camellias in greenhouses. I find that it has since spread out of doors, and that it is common about Wellington on *Euonymus*, weeping willow, and other garden trees and shrubs. Its whitish or grey scales cover the bark in great numbers.

Aspidiotus carpodeti, sp. nov.

Figs. 1, 2.

Female puparium usually light-brown, but varying a little with the colour of the tree; convex; circular, the pellicles in the centre: some specimens are slightly elongated. Average diameter $\frac{1}{16}$ inch.

Male puparium narrow, with parallel sides; not carinated; dirty-white or brownish colour; length about $\frac{1}{16}$ inch.

Adult female of the normal peg-top shape, the abdomen not so much overlapped as usual. Abdomen ending in two median, somewhat prominent, lobes, with two others much smaller not in close proximity; edge of the body jagged with curvilinear incisions, amongst which and between the lobes are a number of serrated pointed hairs as in *A. nerii*. Four groups of spinnerets: lower pair with 4–6 orifices, upper with 6–10. These groups seem surrounded by a narrow line as if enclosed in a chamber: the same appearance is presented (according to a figure of Mr. Comstock's) in *A. nerii*. There are many single spinnerets.

The adult male is of normal form, with antennæ of ten joints of which the seventh, eighth, and ninth are the longest. The haltere (fig. 2) has a somewhat long peduncle. The abdominal spike is rather long, and springs from a large tubercle.

On *Carpodetus serratus* and *Vitex littoralis* (*puriri*), but I think my specimens on the latter tree had only spread from the former. The puparia are so like in colour to the bark that it is difficult to detect them.

This insect is evidently closely allied to *A. nerii*, but seems to differ in the abdominal lobes of the female and in the antennæ of the male; its male puparium is also much longer, and that of the female more convex than in that species.

Genus, *Mytilaspis*, Targioni-Tozzetti.

1. *Mytilaspis epiphytidis*, sp. nov.

Fig. 3.

Female puparium flat, pyriform, brown in colour, thin; length about $\frac{1}{11}$ inch.

Male puparium narrower than that of the female, and a good deal darker, being sometimes almost black; length about $\frac{1}{10}$ inch: not carinated.

Adult female of normal form of *Mytilaspis*. Abdomen ending in two median lobes: along the edge several deepish curvilinear incisions between which are some strong spines. Five groups of spinnerets: lower pair with 14–16 orifices, upper pair 12–16: uppermost group 4–6.

I have not seen the adult male: the pupa exhibits apparently a very long abdominal spike.

This insect is closely allied to *M. pyriformis*, mihi, but differs in the lobes of the abdomen in the female, and in the very dark puparium of the male. However, I cannot consider it with certainty a new species. It is undoubtedly not a *Chionaspis*.

Hab. On *Astelia cunninghamii*, an epiphyte on numbers of our forest trees.

2. *Mytilaspis pyriformis*, mihi.

(Trans., vol. xi., p. 194; vol. xii., p. 121.)

This insect occurs abundantly near Wellington on *Dysoxylon spectabile*, in company with *Chionaspis dysoxylis* and *Fiorinia asteliae*. It may be easily distinguished from the latter, of course, by the second pellicle of the female; from the former it differs by the puparium of the male, which in the *Mytilaspis* is brown and not carinated, and by the generally much larger size and brown colour of the female puparium. The abdominal segment of the female is also a clear distinction.

Some of my specimens attain a length of $\frac{1}{8}$ inch for the female puparium.

Genus *Chionaspis*, Signoret.

1. *Chionaspis dysoxylis*, sp. nov.

Figs. 4–6.

Female puparium thin, flattish, pyriform, white in colour with a faint pink tinge when the egg-mass beneath shows through it. Length about $\frac{1}{12}$ inch. The second pellicle is comparatively large.

Male puparium white, narrow, carinated; length about $\frac{1}{8}$ inch.

The insect affects principally the leaves of the plant, and the puparia are usually clustered thickly along the midrib.

Adult female of general form of *Mytilaspis*, not very deeply corrugated; colour, yellowish red. Abdomen ending in a broken curve with many curvilinear incisions. There are fourteen lobes, of which the two median are the largest; separated from them by a spine on each side are two others rather smaller; then another spine and a short open space; and then three smaller lobes and another spine; another space, and then a single small

lobe followed by a spine. Five groups of spinnerets: lower pair with 12-14 orifices; upper pair with 7-10; uppermost group, 4-6. A few spiny hairs are on the edge of the abdomen.

I have not been able to hatch out an adult male, though the male puparia are very numerous.

Very abundant on *Dysoxylon spectabile*, often in company with *Mytilaspis pyriformis*. It seems to differ from all described species in the abdominal lobes of the female.

2. *Chionaspis citri*, Comstock.

(Second Report of Entomol., Cornell University, U.S.A., 1883.)

An insect which occurs here sparingly on oranges imported from Sydney belongs, I think, certainly to this species.

3. *Chionaspis minor*, sp. nov.

Female puparium white, small, not more than $\frac{1}{15}$ inch in length, usually less; it is narrower and less pyriform than is usual in the genus, and is often bent in the middle; pellicles yellow.

Male puparium white, narrow, elongated, carinated, about $\frac{1}{30}$ inch in length.

Adult female not deeply corrugated, with general form of *Mytilaspis*; colour dark brown. Abdomen ending in six small lobes, of which the two median, the largest, are closely contiguous. Between them and the next pair is a spine; then beyond the second pair another spine, a space, and a third pair of very small lobes; after a long space there is another spine. Five groups of spinnerets—uppermost group with 12-14 orifices; upper pair, 14-17; lower pair, 18-24; many single spinnerets.

I have not seen the adult male.

Abundant sometimes on *Parsonsia*; also frequently on *Rhipogonum* (supplejack).

The smallness of this species and the contiguous median lobes of the female abdomen sufficiently distinguish it.

Genus *Diaspis*, Costa.

1. *Diaspis boisduvalii*, Signoret.

In my paper of 1878 I reported this insect as occurring in hothouses. I find that, like *Asp. camellia*, it has spread out of doors, and is common on several garden shrubs. I have found it abundant on the wattle.

2. *Diaspis santali*, mihi.

(Trans., vol. xvi., p. 122.)

I have received from G. E. Alderton, Esq., of Whangarei, specimens clearly belonging to this species, which in that locality seems to have spread from the native trees to the orchards, and is infesting in great numbers pear, plum and other fruit trees.

Genus **Fiorinia**, Targioni.*Uhleria*, Comstock, *loc. cit.*, p. 110.1. *Fiorinia stricta*, mihi.

(Trans., vol. xvi., p. 124.)

I find that this insect is more common than I had supposed. It occurs on several native plants, *Astelia*, *Muhlenbeckia*, *Cordyline*, etc.; and on the last-named tree, in the Hutt Valley, I have seen it covering the leaves in countless thousands, as also on *Phormium*. I find also that in some specimens four very minute lobes may be detected between the sharp comb-like teeth of the abdomen.

2. *Fiorinia asteliae*, mihi.

(Trans., vol. xiv., p. 217; vol. xi., p. 201.)

Figs. 7-9.

There are some modifications in the second female pellicle of this insect on different plants which do not seem to be sufficient for the establishment of new species, as I cannot detect in the adult stage or the general habit any clear differences. The normal pellicle exhibits, as described in Trans., vol. xi., p. 202, two prominent lobes just before the abdominal segment, and that segment itself terminates in a number of small blunt serrations. Sometimes, however, I have found specimens (on *Cyathodes acerosa*) where the two lateral lobes were absent, and others (on *Astelia cunninghamii*) where the abdomen ends, as shown in the figure, in large, peculiar, tusk-like lobes. The normal form I have found most frequently on *Atherosperma nova-zealandia*. I am not prepared to consider the differences mentioned as amounting to more than variety.

Group.—LECANIDÆ.

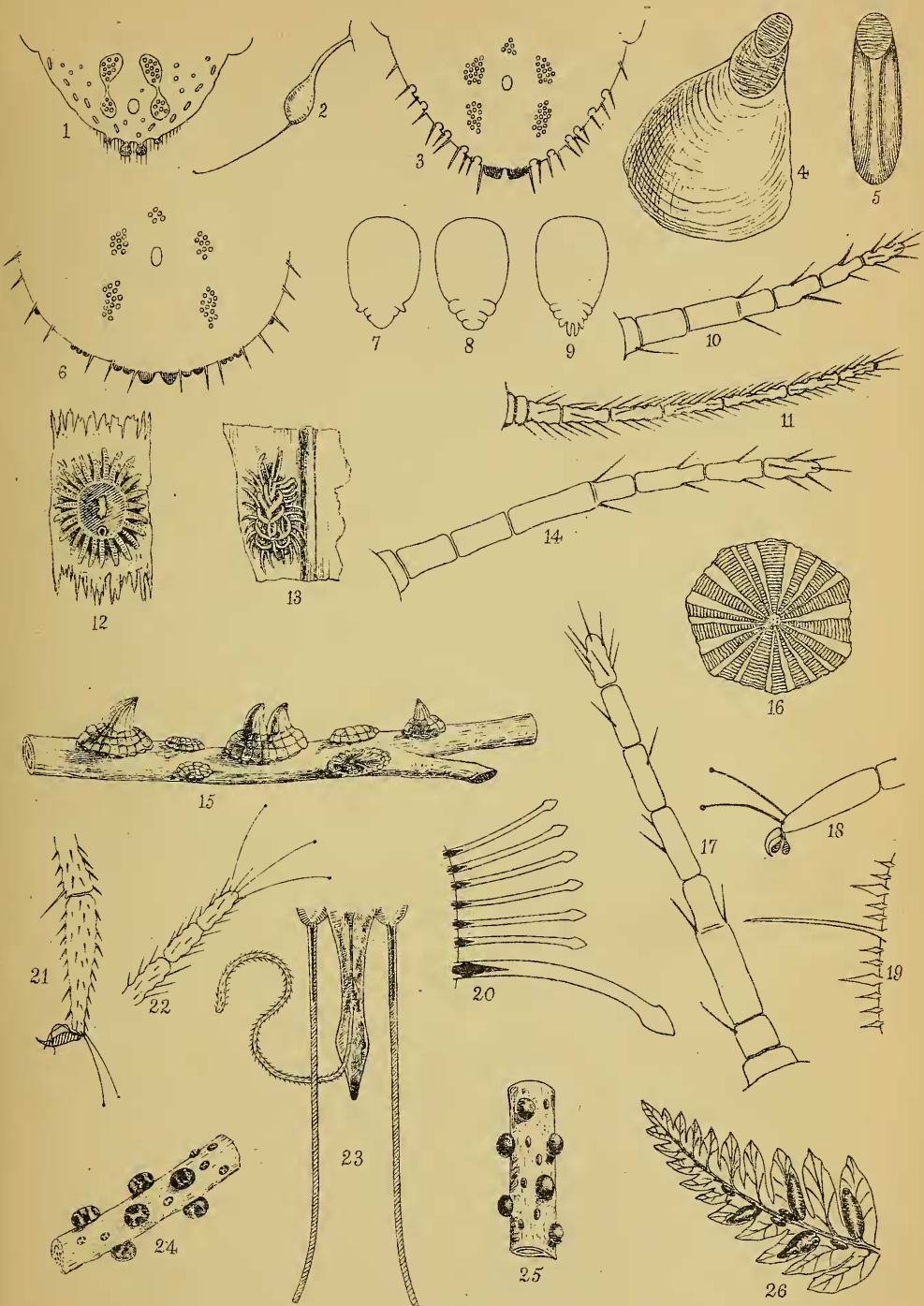
Subsection I.—LECANIO-DIASPIDÆ.

Genus **Ctenochiton**, mihi.1. *Ctenochiton viridis*, mihi.

(Trans., vol. xi., p. 211.)

The male of this species, of which I have hatched out some half dozen specimens in the last year, presents no striking features. The test is white, glassy, oval, and slightly convex, about $\frac{1}{8}$ inch long, divided into hexagonal segments marked with radiating lines like that of the female, and with a somewhat large fringe. Towards the posterior end it is cut across by a dividing line, and the insect when emerging lifts up the last segments of the test on this line as on a hinge.

The perfect insect has antennæ of nine joints, feet normal (but I cannot make out any digitules), thoracic band small and inconspicuous. There is a spine at the extremity of the tibia,



NEW ZEALAND COCCIDÆ.

W. Maskell, del.

The only means of distinguishing this from the male of *C. perforatus* seem to be in the test, where the rows of perforated air-cells characteristic of that species are absent.

2. *Ctenochiton spinosus*, mihi.

(Trans., vol. xi., p. 212; vol. xiv., p. 218.)

I have to add to the habitat of this species the bark of *Muhlenbeckia* and of *Melicope ternata*. The insect is very difficult to detect, as it is usually of almost the same colour as the bark.

3. *Ctenochiton hymenanthææ*, sp. nov.

Figs. 10, 11.

Test of female waxy, circular, convex, dirty white, yellow, or brownish, formed of a number of hexagonal or octagonal segments, which are also convex, giving it a rough appearance. Fringe not very conspicuous. Diameter of test about $\frac{1}{12}$ inch.

Test of male glassy, white, oval, segmented, slightly convex, segments of fringe small. Length about $\frac{1}{16}$ inch.

Adult female yellowish brown, fitting the test. Antennæ (fig. 10) of six joints, of which both the second and third seem sometimes double. Foot normal; upper digitules long fine hairs, lower pair broad. The spiracular spines are strong and conspicuous. The skin is divided into segments corresponding to those of the test, the divisions being marked by lines of spinneret orifices which are small and simple.

In the second stage the usual wavy edge of the genus is not generally apparent.

Adult male somewhat thick and short. Antennæ (fig. 11) of nine joints, the first short and thick, the remainder long and nearly equal: each joint after the first has many nodosities from which spring longish hairs. Foot long and slender, especially the tibia. Digitules fine hairs. Thoracic band inconspicuous. Abdominal spike short and blunt.

This species is usually accompanied by a great quantity of very black fungus covering and rendering unsightly the whole plant on which it lives.

From *Hymenanthera crassifolia*.

This insect seems to be intermediate between *C. piperis* and *C. depressus*, differing from both in the rugose female test and the distribution of the spinneret orifices.

4. *Ctenochiton piperis*, mihi.

(Trans., vol. xiv., p. 218.)

The male test of this species is more oval than that of the female, and somewhat smaller, averaging about $\frac{1}{20}$ inch in length. It is otherwise so similar in its divisions, colour, and general appearance, that it cannot be mistaken for that of any other species,

The adult male has nine-jointed antennæ, all the joints except the first long and hairy. Foot not so slender or long as in the last species, the tarsus being a good deal thicker. Digitules fine hairs. The penis, in some of my specimens, which as usual protrudes from the abdominal spike as a long white soft tube with minute hairs, seems to end in a somewhat large round knob, which I have not noticed in any other species.

5. *Ctenochiton elæocarpi*, sp. nov.

Figs. 12-14.

Test of adult female oval, nearly circular, black in colour, divided into hexagonal and pentagonal segments which are not conspicuous, and of which the median series forms a very slightly elevated ridge somewhat lighter in colour. The test is only slightly convex. The fringe is very long and conspicuous, the segments toothlike. Diameter of test, exclusive of the fringe, reaches $\frac{1}{8}$ inch.

The adult female fills the test, as usual. Colour black: antennæ somewhat long (fig. 14), of seven joints (I think, otherwise the third joint is abnormally long), a few hairs on the last joint. Foot normal; upper digitules strong and thick, lower pair very broad. On the skin are a number of large oval spots which appear to be the orifices of spinneret tubes.

In the second stage this insect has a somewhat remarkable test of white wax, which is not, as usual, almost homogeneous, but is made up (fig. 13) of a number of detached plates somewhat resembling those of the genus *Orthezia*. The fringe is here even longer than in the adult, and its long white teeth curl in different ways, so that the whole test presents a rather elegant appearance. The insect beneath has the normal Lecanid shape, but wants the usual wavy outline of *Ctenochiton*. All round the edge is a row of sharp conical spines set pretty closely together. Feet normal; antennæ of six somewhat confused joints. Extreme length of test, including fringe, sometimes $\frac{1}{8}$ inch.

I do not know the male.

From *Elæocarpus dentatus* (hinau) in the neighbourhood of Wellington.

This species is, in some respects, similar to *C. fuscus*, mihi (Trans., vol. xvi., p. 131), but differs in the much more flattened adult test, the longer antennæ, the presence of the oval spots, and also in the peculiar test of the second stage.

Ctenochiton flavus, mihi.

(Trans., vol. xvi., p. 130.)

The tests of the second stage of this species, which resemble somewhat *Ceroplastes rusci*, Linn., occur not uncommonly on *Elæocarpus* and *Leptospermum*, near Wellington.

Genus *Inglisia*, mihi.

(Trans., vol. xi., p. 213.)

1. *Inglisia leptospermi*, mihi.

(Trans., vol. xiv., p. 220.)

The test of the male is white, elongated, convex, not unlike that of the female, but with a longer fringe; it has also its posterior segment divided from the rest by a transverse slit or hinge; average length about $\frac{1}{15}$ inch.

The male is yellowish green in colour, the body slender and tapering. From the abdomen spring two very long white cottony setæ, one on each side of the spike, which is straight and short. Antennæ of ten joints; the first two short, the rest long, thin, and hairy. Of these the seventh, eighth, and ninth are the shortest; on the last joint three long knobbed hairs. Feet slender, hairy; digitules normal. Thoracic band inconspicuous. Four pairs of eyes.

I only once found specimens, from which I hatched four males, on *Leptospermum*, the favourite tree of this species.

2. *Inglisia ornata*, sp. nov.

Figs. 15-23.

Test of adult female reddish brown, the base more or less oval, the rest elevated in a cone and ending in a prominence standing up like a more or less sharp horn; sometimes there are two of these horns. The test is formed of a number of polygonal segments, each slightly elevated, and all are marked with the radiating striæ peculiar to the genus. There is a fringe of sharply triangular segments, also striated. Average length of test about $\frac{1}{8}$ inch, but specimens attain a length of $\frac{1}{4}$ inch; height about $\frac{1}{10}$ inch.

Test of second stage generally resembling that of the adult, but smaller and less conical, and more tinged with green; and at the edge a number of short spinneret tubes may be seen protruding.

Test of the male elongated oval, convex, but wanting the prominent horn of the female, glassy, white tinged with yellowish brown, composed of segments marked with conspicuous striæ. Length, $\frac{1}{12}$ inch. Fringe often present, but irregular; often absent.

The adult female fills the test, shrivelling after gestation. It exhibits the horn, or two horns, as in the test. Antennæ of seven joints (fig. 17): the third joint showing the false division noted in other species of Lecaniodiaspidæ. Feet normal: upper digitules strong and thick, lower pair rather broad. Along the edge of the body is a row of sharp lanceolate spines (fig. 19), set closely together: and the spiracular spines are long

and conspicuous. A double or triple row of minute circular spinnerets marks the divisions corresponding to the segments of the test. Colour of the insect greenish, turning brown after gestation. The abdominal lobes are brown.

In the second stage the female resembles generally the adult; but the antennæ have six joints, and amongst the marginal spines are some very much larger than the rest.

The young larva is flat and oval, and at the margin shows a fringe of long glassy pointed tubes (fig. 20), springing from the marginal spines.

The adult male is about $\frac{1}{30}$ inch in length (exclusive of the wings), brownish or reddish yellow in colour, the wings hyaline and iridescent, with red nervures. Antennæ (fig. 22) of ten joints, on the last of which are, amongst others, three long knobbed hairs. Foot with a spine at the extremity of the tibia; digitules fine hairs (fig. 21). At each side of the abdominal spike springs a strong seta, from which extends a white cottony pencil, as long as the body of the insect. The penis is as usual a long soft cylindrical tube covered with minute recurved spines. Thoracic band short and narrow.

From *Elæocarpus* (hinau) and *Leptospermum* (manuka), but apparently the former is the principal habitat. I have only found it as yet in the North Island, sometimes on twigs in great numbers.

This is a peculiarly elegant insect, the beautifully coloured and striated tests both of males and females forming an interesting object under a lens or the microscope. It cannot be mistaken for any other species that I know of, and the curious horn of the test, especially when double, is quite characteristic.

Subsection II.—LECANIÆ.

Genus *Lecanium*, Illiger.

1. *Lecanium oleæ*, Bernard.

Fig. 24.

I find that this insect is becoming very common throughout this country, especially in the North Island. I have specimens from several plants in gardens and orchards; it is abundant on *Cassinia leptophylla*, the useless and noxious shrub which is covering the hills near Wellington; and Mr. Alderton informs me that it is spreading on the native trees near Whangarei. It may be readily recognized by the large size and black colour of the semi-globular adult females, and the one longitudinal and two transverse keels on the young insects. It is usually known in California and elsewhere as the "black scale."

2. *Lecanium hemisphæricum*, Targioni.

Fig. 25.

Not unlike the last species to the naked eye, but wanting the keels mentioned under *L. oleæ*. It does not seem to be, as yet, common in this country, but occurs on some garden plants—e.g. Camellia, etc.

3. *Lecanium mori*, Signoret.

Fig. 26.

An insect which I cannot identify as any but this species occurs on *Alsophila* and other plants in the Botanical Gardens, Wellington. It is evidently an introduced insect, and as evidently belongs to the series of *Lecanium* of which the type is *L. persicæ*, Réaumur, where the body is oval and slightly convex, reddish in colour, but without keels. The present insect is about $\frac{1}{9}$ inch long, smooth, naked, with antennæ of seven joints. The skin exhibits no tessellations or markings.

I have not seen the adult male, but there is a white and glassy male test.

Group.—COCCIDÆ.

Genus *Acanthococcus*, Signoret.

1. *Acanthococcus multispinus*, mihi.

(Trans., vol. xi., p. 217.)

Occurs near Wellington on *Knightia excelsa* and *Cyathodes acerosa*.

Genus *Eriococcus*, Targioni.

1. *Eriococcus pallidus*, sp. nov.

Female enclosed in an elliptical sac of felted secretion, which is yellowish white in colour, and about $\frac{1}{9}$ inch in length. This sac completely envelopes the insect, being closed in at both ends.

Female insect greenish grey in colour, turning brown after gestation; at first filling the sac, but shrivelling as the sac becomes full of eggs. Antennæ of six joints, of which the third is twice as long as any other. Tibia and tarsus slender; upper digitules fine hairs, lower pair narrow and somewhat long. Anal tubercles rather large; anal ring with eight hairs (sometimes only six). The body is segmented, but without deep corrugations, and along the middle of each segment runs a line of conical spines, not set very close together and somewhat slender. There are very many small oval spinneret orifices all over the dorsal surface.

Not uncommon throughout the islands on several plants, e.g., *Myoporum latum* (ngaio), *Elæocarpus* (hinau), etc. It may be readily recognized by the yellowish-white elliptical felted sac.

The genera *Eriococcus*, *Rhizococcus*, *Acanthococcus* require revision. The present insect resembles *E. buzi*, Signoret, in its sac, but differs in its paler